planning health services. Both quantity and quality could be manipulated to meet the budget and the public would never realize until long afterwards that they had received less of both than they had been promised. It could be used as a means of limiting services as well as freezing costs. The per capita concept should be challenged as being a third rate solution.

I trust that the Canadian Medical Association will continue to give leadership in its first duty, namely to protect and encourage the high quality of care received by our patients.

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Atraumatic endotracheal tube

To the Editor:

Tracheal stenosis is a serious complication that may follow prolonged assisted respiration. It has been suggested that the stenosis may be the consequence not so much of the inflated cuff on the tube as of the accumulation of infected and/or corrosive debris which collects at the upper and lower margins of the inflated cuff.

Those who have used the atraumatic endotracheal tube which I described first in the *Lancet* in 1968 and in the Journal in 1970 (*Can Med Assoc J* 102: 875, 1970) have been impressed with how much debris collects in the base of the valve. It would seem reasonable to assume that a similar collection accumulates *around* the inflated cuff and that this accumulation remains when the cuff is deflated and withdrawn.

To study this possibility I constructed a model consisting of a plastic trachea and bronchi with "lungs" to provide elastic recoil. The model was based upon the device used in the first aid training of oral resuscitation.

The model was intubated using a cuffed tube and then connected to a ventilator, or pneumoflator. The actual pressure in the inflated cuff was measured by attaching it to a mercury manometer. These recordings alone were worth while and prompted me to consider advocating such pressure measurements in routine anesthetic work. Varying amounts of mucus and stomach contents were introduced into the "trachea". The object was to study what happened to such foreign matter during prolonged assisted ventilation.

It was found that even very high pressures in the inflated cuff do not exclude mucus or gastric content. Invariably, a ring of accumulated debris settled around the cuff. When the atraumatic endotracheal tube was used, a modest amount got past into the "lungs" but the remainder settled in the base of the valve, not in contact with the trachea.

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The oldest profession?

To the Editor:

I believe that Dr. Gough (*Can Med Assoc J* 106: 305, 1972) is in error in accepting Dr. Jim Melvin's suggestion that psychiatry is the oldest profession because in the beginning all was chaos. The chaos was obviously the work of the politicians and therefore they have a legitimate claim to being the oldest profession.

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Non-traumatic gas gangrene: report of a case with long term survival

To the Editor:

Gas gangrene is usually the result of local trauma to muscle with the introduction of Clostridial organisms at the wound site. Rarely, non-traumatic gas gangrene may occur in elderly debilitated individuals because of the hematogenous spread of organisms from ulcerating lesions of the gastrointestinal, biliary or genitourinary tracts. None of the latter cases have survived for an appreciable length of time. This is a report of long-term survival in a case of nontraumatic gas gangrene in an otherwise healthy woman with chronic idiopathic granulocytopenia.

Case report:

This 40-year-old white woman had enjoyed good health except for an episode of urticaria in her teens when a leukocyte count of 1700 was discovered. At 1:00 a.m. on August 23, 1969, she was awakened by pain in her right thigh which increased steadily through the night. There was no history of trauma. When examined at 7:00 a.m. she was toxic-looking and in great distress. The temperature was 98.6° F., pulse 150, blood pressure 130/90. The general physical examination was unremarkable except for scattered patches of vitiligo. The patient was menstruating. The right thigh was swollen with a circumference of 19 in. compared to 18 in. on the left. The skin of the right leg was intact and normal in color. Tenderness and subcutaneous crepitus were noted at the junction of the middle and lower thirds of the anterior surface of the right thigh.

Hemoglobin was 14 g. %, leukocyte count was 2700. The roentgenogram of the right thigh (Fig. 1) confirmed the presence of interstitial gas. A needle aspirate of the affected area yielded 0.5 ml. of serosanguineous fluid which demonstrated plump gram-positive rods with rounded ends and rare free ovoid spores. These organisms were subsequently identified as *Clostridium perfringens et septicum* by culture techniques.

Despite the immediate administration of penicillin and polyvalent anti-gas gangrene antiserum, by 11:00 a.m. the skin over the entire anterior surface of the right thigh was tense, yellow, and surrounded by an irregular blue border. Crepitus was present in the underlying tissues. Because of the rapid course of the infection the patient was taken at once to the operating room for debridement. Under general anesthesia the anterior compartment of the thigh was opened and the entire muscle mass was noted to be devitalized with bubbles of gas

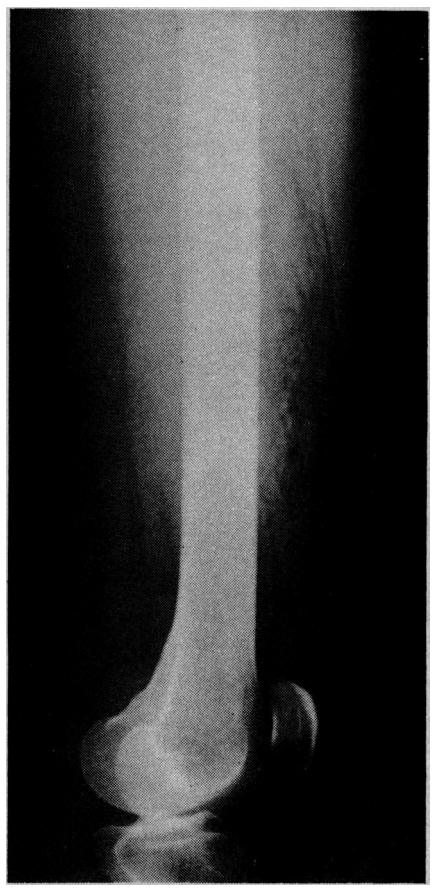

FIG. 1—Roentgenogram of the right thigh demonstrating interstitial gas.

present in the tissue fluid (Fig. 2). All the tissue in the compartment was removed except for the femoral vessels and their surrounding sheath. Upon completion of the operation the patient was transferred from the Jewish General Hospital to the Royal Victoria Hospital for hyperbaric oxygen therapy.

Subsequent repeated leukocyte and differential counts demonstrated chronic noncyclical neutropenia. A representative leukocyte count was 2300 with 437 band neutrophils, 138 mature neutrophils, 46 basophils, 253 eosinophils, 253 monocytes, and 1081 lymphocytes. Bone marrow studies showed granulocytic hyperplasia with maturation arrest. Serum folate and B12 levels were normal. There was no evidence of diabetes mellitus and quantitative IgA, IgG, and IgM studies were normal.

The gas gangrene infection was controlled but the patient's course was complicated by chronic recurrent local infection which progressed to femoral osteomyelitis despite repeated debridement and antibiotic therapy. A high amputation of the right leg was performed on March 3, 1970 followed by secondary closure of the stump.

Discussion:

The few reports of non-traumatic gas gangrene of a limb in the literature describe patients over 70 years of age, many of whom had cancer for which they were receiving chemotherapy.[1, 2] These drugs had induced leukopenia in many of the patients suggesting that the relative absence of neutrophils may predispose to Clostridial infections. Against this is the fact that not all of the previously reported cases had granulocytopenia. There is little evidence at present to indicate that the neutrophil plays a significant role in defense against Clostridial infections.[3, 4] Our patient did not have a history of repeated infections, suggesting that the neutropenia was not significant, nor could a primary site of Clostridial invasion be found.

The most striking aspect of this case is the fact that the patient is alive and well two years after the acute episode. To our knowledge this is the only case with a long-term survival. This may be due to the relative youth of this woman compared to the age of previously reported cases, as well as to the prompt diagnosis and early treatment she received.

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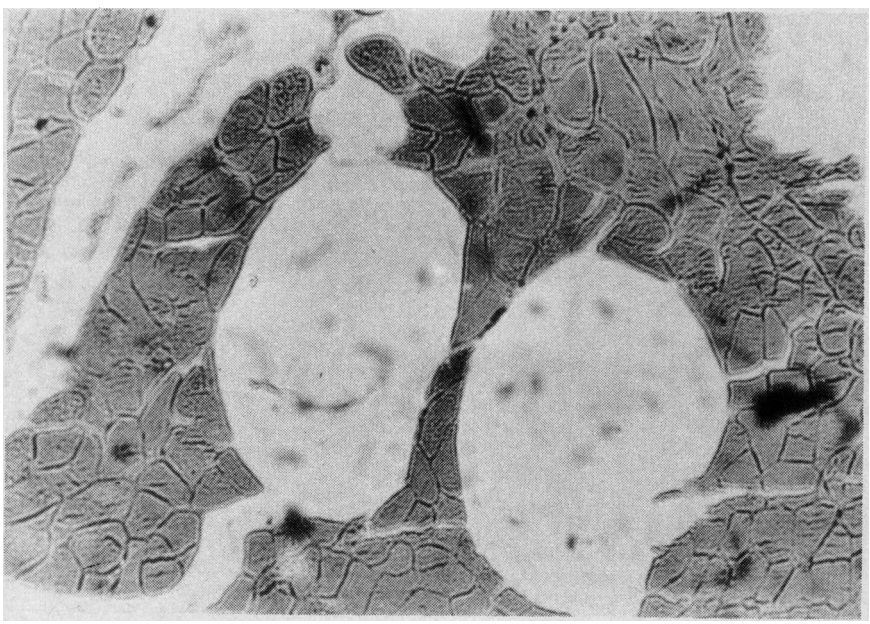

FIG. 2—Photomicrograph (magnification x 100) of resected muscle demonstrating displacement of muscle by gas bubbles.